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ORIGINAL COMMUNICATIONS.

VITAL FORCE.

BY CHARLES MAYR, A. M., SPRINGFIELD, MASS.

It is astonishing how tenaciously some old terms will hang around our scientific schools, loaf about monthlies, and crowd themselves into scientific meetings. One of the very worst is vitality or, as the force which produces the "vitality" is often termed, "vital force." It is another remarkable fact that, though the word has disappeared from almost all the French or German schools, text and reference books, there is probably no school physiology in America and England which does not parade amply "vital" and "chemico-vital" processes, greatly to the delight of thoughtless teachers and pupils. Let us look exactly into this "vital force." Dr. Flint, an exceedingly cautious observer and recorder of observations, says: "If we confine ourselves to physiological facts we cannot admit the existence of a single vital principle which animates the entire organism. Each tissue appears to have its peculiar property dependent upon its exact physiological constitution, which we call vitality; a term which really explains nothing." So far Flint. Why should we now attack such a harmless little term which "explains nothing?" Just for this very

reason: As no one is able to connect any distinct idea with "vitality," one is too apt to suppose that some one who first used the term meant something by it, and that it explained to him satisfactorily what we cannot understand; we therefore suppose the matter to be all right and are lulled into a false security. It is true, it sounds very bad to be forced to say: we do not know it yet! but we do not gain by putting some varnish over a glaring spot of ignorance; far better to let it be seen by every one; perhaps there may come one who will wipe it out.

But unfortunately not only bashful ignorance hides itself behind this word; a kind of scientific hypocrisy uses the term where something else is meant. Why not use plainly the Anglo-Saxon word, "soul," when it is needed,—but it sounds so harsh! We should be very pleased to use either word if it meant the very least; but while "vitality" is supposed to be all-powerful, to build up the whole body, to carry on all its processes, one-fifteenth of a grain of atropia is sufficient to annihilate every trace of it. Would it not be good, by the same kind of logic, to call the force of the atropia atropal force, and the state produced by it atropiality? One fifteenth of a grain of atropia has more strength than all the vitality stored up in one hundred and fifty pounds of human organism! All attempts to explain the action of poisons on the supposition of the mysterious vital force as the all-powerful maintainer of life, have failed thus far. There is, besides, a certain cowardice in the use of such a vague word; it baffles and dodges all square fights; as soon as you put your finger on it, it is no longer there. Not fifty years ago every part of the body was "vitalized," from the urea, glycerine-phosphoric acid and lecithine to the albumen. Urea and lecithine have been produced identically in our laboratories. But these facts did not disturb the defenders of "vital force;" they simply pitched their tents "a little further West." Vital force retreated to albumen; when it was beaten out there, it retreated to the brain; and now it only clings still to the body by the protoplasma fibers. Let us hope a speedy flight of the vague word and the vague idea from this last retreat.

But what is live tissue? Though we cannot admit any special new force besides our well-known chemical and physical forces acting in the body, we have to acknowledge a radical difference between a certain organ, say a muscle in a living being, and the same organ in the same being, when it is dead. The life of every being is a succession of chemical and physical changes in its protoplasma network or in its bioplasson; as long time as this network is provided with proper

circulation, the first impulse of which was given to it by the mother-organism, just as long and no longer will the immensely complicated machine run; all the changes in the tissue of a living being are the same as they are immediately after its death; the tissues in contact with air, etc., decompose; but while after death there is no circulation to carry away the decomposition products as fast as they are formed, they are disposed of as long as the individual lives, by being transported to the proper organs to be absorbed, secreted or oxydized. After death, therefore, they will accumulate, will combine with the still undecomposed protoplasma, will cause first its coagulation and afterward its decomposition. This is the essential difference between live and dead tissues; from this stand-point it is very easily intelligible why any stoppage in the circulation is so speedily fatal to the parts affected. No disease of the lungs kills quicker than extensive embolism; hemorrhage of the brain is not necessarily fatal by the direct insult, but more by the disturbance and interruption of the circulation. Whatever cases of death we may consider, we will find that all of them are easily explained by the disturbance and interruption of the circulation. I mean by circulation not only the circulation of blood, but also of serum, lymph and other liquids of the body. Furthermore, the disturbance of circulation may have its seat in the nerve centers. All circulation is to some extent regulated by the "nerves," or rather by the bioplasson; special twigs of this substance run from the brain to every organ of the body. By affecting these twigs we can interfere with the circulation almost as much as if we would make a local disturbance; e. g., by cutting the fifth nerve at a certain point we may interfere with the proper circulation of all the fluids in the eye, and the eye may slough off. The effect of these nerves is rather to regulate than to produce the circulation. The propelling power of the whole circulation is at the foundation in the heart. But those who expect that here "vital force" will have to come in, would be deceived, since all kinds of stimuli have proved sufficient to cause the heart to contract, from warm water to electricity. Does, in cases where the heart has ceased to beat, perhaps for hours, and it commences again, "vitality" return? and where was it gone in the meanwhile? Can "vitality" be generated out of warm water? But if we consider circulation as essential for life, we may understand that in such cases the products of decomposition have not yet accumulated enough to coagulate the bioplasson and hereby render contraction impossible. Scientific investigators should never be ashamed to acknowledge

ignorance, where they do not know anything; but it is their right, nay, almost their duty to give a certain probable view of the case, only let them state it as plainly and clearly as language will allow. To those who enjoy big, meaningless words, we would recommend as reading matter the comedy of Moliére: Le Malade Immaginaire—the imaginary invalid. Two hundred years ago he ridiculed this tendency in a most skilled and clever manner. What Dickens was for the monstrosities of the English law, Moliére was for those of the physicians of his (our?) time.

INTERVIEWS.

Almost every city has a dentist who for a long period has been active in his profession. The great amount of experience amassed during a long period of practice ought to become common property of the profession. But men active with the mallet and plugger are not always at leisure to use pen and ink, and as the asking of questions is rather easy, we thought it a good idea to interview Dr. F. Searle of this city on certain points where experience alone can give reliable results. In a series of interviews, we propose to give our readers the grains of wisdom resulting from an exceptionally large experience extending over more than forty years. For this number, we interviewed Dr. Searle on *Local Anæsthetics*.

Q. Have you ever used morphia locally, and with what results?

A. I have used morphia locally in my earlier practice until I found that its effect was too slight to recommend its further use. If you give morphia internally to that class of patients who need it most, you will find that it renders them so sick and produces such general unpleasant symptoms that it seems hardly advisable to use it. If I now would use it at all, I would use it in combination with aconite, locally.

Q. Have you enclosed solid morphia in a cavity, and with what effect?

A. I have used it in this manner, but with no effect at all upon the constitution, and painful effects on the tooth; I could not explain the pain otherwise than by supposing the first effects of the morphia being to irritate the tissues.

Q. It acted, probably, like any other foreign body?

A. Harsh and incompatible. I used it also in connection with "Lethion," when "Lethion" first came into the market, when we first began to administer ether. I knew the parties; they sold the

receipt to give "Lethion"—from Lethe, the river of forgetting in the Greek Hades, hence "producer of forgetting," or sleep. They put morphia into the ether; the morphia was soon discontinued; it had no effect; it was only used to cover the real article and make it a compound. A few years ago Dr. Chase, of St. Louis, published an article saying that he had succeeded admirably in packing morphia into the cavities of teeth, and that this was the only remedy which never gave any pain. Immediately I put it into practice and followed it up until I found the reverse experience; I got no good whatever.

Q. Have you ever used any other organic local anæsthetic?

A. Chloral, or what is better called chloral-hydrate dissolved in camphor; they will dissolve readily and form a liquid. I have found it a local anæsthetic in operating on sensitive dentine. I speak with caution because persons often manifest pain when it is only the effect of fear. I mention it because I have obtained relief from its use. Perhaps if we could combine aconite with the mixture it might increase its effect; but I never tried it. Another local anæsthetic I used now and then is amyl, but I have a certain disinclination against it because of its odor.

Q. How far did you make use of arsenic as a local anæsthetic?

A. If I could use it just to the right point and know when to stop its use and how to arrest its action, it would be the most valuable remedy I would ever use. In my earlier practice, before I became afraid, I obtained some good results with the bad ones, but I found it so unmanageable, it operated so differently in different cases, that I have almost ceased to use it as an anæsthetic.

Q. In what time does the pain usually subside with judicious application of arsenic as a local anæsthetic?

A. No uniformity. In cases where there are pulp-stones or nodules in the pulp, I have found it to give intense pain for a long time; but even in the case of sensitive dentine it may give severe pain for hours, which may then cease. It should never be used in the first case. But we cannot always diagnose those pulp-stones; we may have our suspicions about them and remove the tooth and discover them, but otherwise they are difficult to diagnose. I do not remember that it generally gives much pain if used with creosote and applied to sensitive dentine, as I use it now and then.

Q. Have you ever observed cases of pure dental neuralgia without any gross anatomical lesions, for the causes of which we would have to look to the protoplasma fibers in the tooth?

A. It is a very common thing, and persons will come to me with what I term dental neuralgia. I once used the term at the dental convention at Saratoga, when I was on the committee for preparing subjects of discussion, and I suggested dental neuralgia as the subject. One of the committee asked what I meant by dental neuralgia; if I meant facial neuralgia. I said that I meant dental neuralgia. Now the term is quite common. What I mean by dental neuralgia is a pain about the teeth which the patients and the physician are very apt to overlook as not having its cause in the teeth. I consider as dental neuralgia only the one having its cause in abnormal conditions of the pulp or the other parts of the tooth. Dr. Garretson once had under treatment a case where the patient had lost all his upper teeth by extracting for neuralgia, without relief. Dr. Garretson examined the case and came to the conclusion that an injury some years ago had compressed the branch of the trigeminus at its passage through the foramen near the naso-massillary articulation; he based his reputation on the fact, performed the operation and cured the patient. This was therefore no dental neuralgia.

Q. What do you think about carbolic acid as an anæsthetic?

A. It is the most reliable we have; we could not get along without it. I have tried all, and think it the best.

Q. How do you suppose it acts?

A. By protection; coagulating the tissues beneath and protecting them from the oxygen of the air and other irritants.

Q. Have you met with cases where carbolic acid remained in a cavity for years without being entirely absorbed away?

A. Yes, I have known where the odor of carbolic acid was still present in the cotton years after it was put in; it shows great tenacity; it is probably because it encases itself into a shell of coagulated albumen.

Q. Have you ever observed any constitutional symptoms from the use of carbolic acid in dental practice, such as nausea, heavy breathing, slight fainting, etc.?

A. None, whatever. Yes, if you bring carbolic acid on soft tissue, like the lips or tongue, you may get painful sores which last for a week or longer, as I had a case a short time ago, where it came on the lip of a lady and acted like any other escharotic, producing a disagreeable sore. One thing I never saw in print is the use of carbolic acid in canker-sores. There it often gives instantaneous and permanent relief; carbolic acid will not increase the pain

as, e. g., nitrate of silver does, but it will form a protecting cuticle and generally the sores get well within twelve hours. I put a little on cotton so as just to moisten the cotton, and then by carefully touching and re-touching I can produce a protecting cuticle of any desired thickness. This was told me by Dr. J. H. Smith (New Haven).

Dr. Searle then showed his way of applying arsenic. He considers it a bad practice to take the solution on loose cotton, as some dentists do. He takes a small square piece of cotton cloth (size suitable for the cavity), holds one corner with the tweezers, and moistens it with carbolic acid. He then puts a paste on it, consisting of about equal weights of arsenic, acetate of morphia and carbolic acid, and applies this mass to the parts; as the mass weighed about three milligrams (.05 of a grain) and as one-fourth of it is arsenic, it is plain that not more than three-fourths of a milligram (.0125 of a grain) are applied to a tooth.

RESULTS OF ARSENICAL APPLICATION TO "SOFT" TEETH.

Editors of New England Journal of Dentistry:

I suppose that most of the older practitioners, at least, recognize the fact that there are a class of teeth often met with, which, in case arsenization and "root filling" is resorted to, do not ***promise*** as favorable results as a certain other class or classes. The first may be designated as white or soft teeth, as compared with the more dense or darker shades. Given a case of these white or soft teeth with the pulp exposed in such a manner or extent as to render it unadvisable in the judgment of the operator to "cap," and, consequently, arsenic or the forceps resorted to, experience seems to make the former a method of doubtful results; an abscess will probably follow sooner or later. Now I refer to this fact simply to raise the question of how and why this is so—a question which it has never been my fortune to see discussed. I will also venture a theory of my own, which I hope some of your readers will deem of sufficient importance to combat if it is not based upon reasonable grounds.

In order to express my *theory*, I will *suppose* a case in hand, before referred to: a white or soft tooth, especially "*soft.*" Arsenic is applied—what then? A dead pulp, of course. Is that all? Let us go back a little. What do we mean by a "soft" tooth? In the light of the "Heitzmann theory," it must be one in which the protoplasmatic fibrils more largely predominate than in the "hard" teeth. The blocks

of lime-salts within this meshwork of protoplasm are smaller, and the protoplasmatic or live portions of the tooth are coarser and larger. They also extend through all parts of the tooth, dentine, cementum and enamel, connecting the peri-cementum, even, with the pulp. In the ratio of the coarseness or fineness of this protoplasmatic network, we denominate teeth hard or soft. Now, with all due deference to the difference of *opinion* as to the action of arsenic upon a tooth, I claim that a good deal more takes place under its application than the mere death of the pulp. The whole mass of these fibrils, throughout the entire tooth, from pulp to peri-cementum, die also sooner or later (by which I mean in a comparatively short time), as the result of the arsenical application. If, now, we proceed with our "supposed case," and even though we *do* succeed in removing, by some means or other, the *entire* pulp and fill the canal *completely*, what is the condition? The dentine, enamel and cementum still retain a large amount of dead tissue liable to all the results of confined dead tissue. Putrescence must follow. The more natural outlets into the pulp canal are closed, the resultant gases commence a bombardment of the innocent peri-cementum, and a life-and-death struggle with its vitality begins, usually proving fatal to our ungrounded hopes. Allowing this theory a basis in fact, the practical point applies in the matter of judging as to where the "*dead line*" is in cases as they are presented; just how "hard" a tooth must be in order to offer a reasonable guarantee of success in the operations under consideration. I am not considering at all the advisability of using or not using arsenic, but the method, *per se*. In the exercise of our judgment in such cases, constitutional conditions must be taken into account, as well as the tooth itself. They in fact go hand in hand, one the counterpart of the other. When the protoplasmatic fibrils of the tooth are fine, and the blocks of inorganic matter in their meshes are correspondingly large, there exists a proportionately less amount of dead matter to be disposed of and, as is usually the case, the so-called vitality of the peri-cementum is greater—the consequence being a greater vitality to cope with a weaker enemy, the difference being that of degree alone.

QUERIST.

To CLEAN CELLULOID COLLARS, ETC.—Rub with a piece of sponge saturated with sulphuric ether, over the spots where water has failed to remove the soil.—*Items of Interest.*

SELECTIONS AND ABSTRACTS.

THE CELL-DOCTRINE AND THE BIOPLASSON-DOCTRINE.

. . . . . .

The founder of the Cell-Doctrine, Schwann, has recorded in the Introduction to his great work published in 1839 that the doctrine was based to a large extent upon investigation of the constitution of cartilage. After Johannes Müller had described cartilage-corpuscles that were hollow, and Gurlt had spoken of some as vesicles,—when Schwann had succeeded, as he thought, "in actually observing the proper wall of the cartilage corpuscles, first in the branchial cartilages of the frog's larvæ and subsequently also in the fish," he was led by these and other researches to conjecture "that the cellular formation might be a widely extended, perhaps a universal, principle for the formation of organic substances." And just as the study of cartilages has led to the cell-doctrine, which at the time of its establishment was a great advance in biological science, so the further study of cartilage has supplied the basis for a generalization which is a further development, and must take the place of the cell-doctrine. This is Heitzmann's doctrine of living matter, or, as I have named it, the *bioblasson-doctrine*.

When the term "cell" was introduced in 1838 and 1839, by Schleiden and Schwann, it was believed that on ultimate morphological analysis every plant and every animal would be found to consist of a number of minute vesicles or sacs, enclosing liquid contents in which is suspended a more solid body, the nucleus. For fully twenty years this idea has been known to be erroneous. In fact, *Goodsir*, nearly *forty* years ago---only a few years that is, after Schwann had established the cell-doctrine and attributed the vital power to the cell-membrane, I say, nearly forty years ago Goodsir had experimentally determined that the seat of the vital process of secretion is *not* in the vesicle as such, but in the so-called cell contents; Naegeli, in 1845, and Alexander Braun, in 1851, had also shown the cell-wall to be comparatively unimportant; and in 1857 Leydig had declared the "cell" to consist only of a soft substance enclosing a nucleus. Certainly, twenty years ago it was proved beyond dispute by Max Schultze, Beale, Hæckel, and others, that what was called a "cell" was not a vesicle, but essentially a jelly-like lump of living matter characterized by the presence of a nucleus; soon after, Robin, Brucke, Kuhne, Stricker, and others,

conclusively showed that not even a nucleus is an essential constituent of an elementary organism; and biologists were compelled to transfer the power of manifesting vital properties to "living matter" instead of restricting this power to any definite form-element. As long ago as in 1861, Brucke proposed to discontinue the use of the word "cell" as being a misnomer and misleading, and offered as a substitute the expression "elementary organism." Beale proposed, instead, the term "bioplast" to designate any definite mass of living matter, and Hæckel the term "plastid." From the latter I devised the word "plastidule" as synonymous with ultimate molecule of the substance of living matter. Elementary living matter is called with Dujardin "sarcode," or with Von Mohl "protoplasm," or with Beale "bioplasm," or, still better (because it is a designation etymologically more nearly meaning living, forming matter), "bioplasson." Of these four synonymous terms, "protoplasm" is the one best known; but has been used in other senses, as well as to designate, merely, elementary living matter. I therefore think that "bioplasson" is to be preferred. Of course, *dead* bioplasson is a contradiction in terms: bioplasson deprived of vitality is no longer bioplasson at all, but merely the chemical remains of what *once was* bioplasson. If this be remembered, there will be no confusion, even if the word be used in describing tissues, etc., after death. According to Drysdale, Dr. John Fletcher of Edinburgh was the first who clearly arrived at the conclusion that "it is only in virtue of a specially living matter, universally diffused and intimately interwoven with its texture, that any tissue or part possesses vitality."

As Fletcher's work was published in 1835, several years before even the establishment of the cell-doctrine, we cannot but agree so far with Drysdale as to say that Fletcher has framed a "hypothesis of the anatomical nature of the living matter which anticipates in a remarkable manner" its discovery! In 1850, Cohn recognized the protoplasm "as the contractile element, and as what gives to the zoöspore the faculty of altering its figure, without any corresponding change in volume." He concludes that protoplasm "must be regarded as the prime seat of almost all vital activity, but especially of all the motile phenomena in the interior of the cell." In 1853 Huxley said "vitality (the faculty, that is, of exhibiting definite cycles of change in form and composition), is a property inherent in certain kinds of matter." In 1856 Lord Osborne discovered carmine staining, and distinguished by means of coloring it the living formative matter from the

formed material, a means which has borne important fruits in the discovery of Cohnheim's staining of living matter by gold chloride, and in that of Recklinghausen's staining all except living matter by silver nitrate.

In 1858, and in a number of later articles, Max Schultze, by showing that, as had been hypothetically supposed by Unger, the movements of the pseudopodia and the granules are really produced by active contractile movements of the protoplasm, as well as by other observations, contributed much to the establishment of the theory of living matter. Hæckel has also for many years, and in various publications, labored to maintain and extend the same theory, of which he thus expresses himself: "The protoplasm or sarcode theory, that is the theory that this albuminous material is the original active substratum of all vital phenomena may, perhaps, be considered one of the greatest achievements of modern biology, and one of the richest in results." And says Drysdale: "If the grand theory of the one true living matter was, as we have seen, hypothetically advanced by Fletcher, yet the merit of the discovery of the actual anatomical representation of it belongs to *Beale*, in accordance with the usual and right award of the title of discoverer to him alone who demonstrates truths by proof and fact. . . . The cardinal point in the theory of Dr. Beale is not the destruction of the completeness of the cell of Schwann as the elementary unit, for that was already accomplished by others. . . . But that, from the earliest visible speck of germ, up to the last moment of life, in every living thing, plant, animal, and protist, the attribute of life is restricted to one anatomical element alone, and this homogeneous and structureless; while all the rest of the infinite variety of structure and composition, solid and fluid, which make up living beings, is merely passive and lifeless formed material. This distinction into only two radically different kinds of matter, viz., the living or germinal matter and the formed or lifeless material, gives the *clue* whereby he clears up the confusion into which the cell-doctrine had fallen, and gives the point of departure for the theory of innate independent life of each part, which the cell-theory had aimed at, but failed to make good. The one true and only living matter—called by Beale germinal matter, or bioplasm—is described as "always transparent and colorless, and as far as can be ascertained by examination with the highest powers, perfectly structureless; and it exhibits those same characters at every period of its existence." . . .

"The name of bioplasm," continues Drysdale, "given by Beale, or protoplasm, as indicating the ideal living matter, cannot be given to any substance displaying rigidity in any degree, nor to anything exhibiting a trace of structure to the finest microscope; nor to any liquid; nor to any substance capable of true solution. Thus, 'nothing that lives is alive in every part,' but as long as any individual part or tissue is properly called living it is only so in virtue of particles of the above-described protoplasm freely distributed among, or interwoven with the textures so closely that there is scarcely any part $-\frac{1}{1}-$ of an inch in size but contains its portion of protoplasm. Thus we see realized the hypothesis of Fletcher, that all *living action* is performed *solely* by virtue of portions of irritable or living matter *interwoven* with the *otherwise dead* textures." The objection, however, urged by *Bastian* to Beale is so very pertinent, that it must also find a place here, but I shall not dwell upon other points on which Beale differs from the bioplasson doctrine; such as, that living matter exhibits the same characters at every period of its existence; and that it is always perfectly structureless. "It has always appeared to me," says Bastian, "to be a very fundamental objection to Beale's theory, that so many of the most characteristically vital phenomena of the higher animals should take place through the agency of tissues—muscle and nerve, for instance—by far the greater part of the bulk of which would, in accordance with Dr. Beale's view, have to be considered as *dead* and inert."

In 1873, the morphological knowledge of living matter became exact. In that year, Heitzmann discovered the manner in which bioplasson is arranged throughout the body, and announced the fact that what had until then been regarded as *separate form-elements* in a tissue are really *interconnected portions* of living matter; that not only are there contained *no* isolated unit-masses in any *one* tissue, but *no tissue* in the *whole body* is isolated from the *other* tissues; and that the only unconnected particles of living matter are the corpuscular elements of liquids, such as blood, sperm, saliva, pus, etc., and so-called wandering corpuscles; so that, to use his own words, "the animal body as a whole is a connected mass of protoplasma in which, in some part, are imbedded isolated protoplasma-corpuscles and various not-living substances (glue-giving and mucin-containing substances in the widest sense, also fat, pigment-granules, etc.") This announcement marked the commencement of a new era in biology.

Heitzmann discovered that the living matter as seen in an amœba

is *not without structure*, as had, before his acute investigations, been supposed; and that its structure, in all cases when developed, is that of a network, in the meshes of which the bioplasson fluid, or the not-contractile, not-living portion of the organism, exists. When there is a nucleus, it is connected by delicate threads with the extranuclear network; nucleoli and nucleolini inside of the nucleus, as well as granules outside, are portions of living matter; sometimes in lump, sometimes mere points of intersection of the threads constituting the intranuclear and extranuclear living networks, sometimes terminals of section of such threads, as first explained by Eimer, and after him by Klein.

Heitzmann discovered that what is true of the structure of bioplasson in the amœba, where a single small unit-mass of living matter constitutes the entire individual, is true also of the structure of bioplasson of all, even the highest, living organisms.

To be sure much had been previously known regarding protoplasm or living matter, but the knowledge was fragmentary, until Heitzmann demonstrated *not only* that membrane, nucleus, nucleolus, granules and threads *are really* the living contractile matter, but also, 1st, that this matter is arranged in a network, containing in its meshes the non-contractile matter, which is transformed into the various kinds of basis-substance, characterizing the different tissues of the body; and, 2d, that the tissue-masses of bioplasson throughout the whole body are *interconnected* by means of fine threads of the *same* living matter.

Unless these two facts of Heitzmann's discovery are accepted, there cannot be urged much against the continued use of the word "cell," misnomer though it be. Ranke, after speaking of the "cell-wall," "cell-nucleus," etc., says: "Of these component parts of the cell, one or other may be wanting without the totality ceasing to be a cell. The nucleoli, the cell-wall, or the nucleus may be wanting, and yet we must designate the microscopic form a cell, or elementary organism." Drysdale thus comments upon this quotation, viz.: "If any one choose to describe a gun-barrel as a stockless gun without a lock, he is free to do so; but what good purpose can it serve? Or is there even any fun in it? The truth is, this clinging to the mere name of the cell-theory by the Germans seems to arise from a kind of perverted idea of patriotism and of *pietas* toward Schwann and Schleiden." But, I think Tyson has the better of the argument in saying: "The word 'cell' has become so intimately associated with

histology, that it is doubtful whether it will ever fall into disuse, nor does it much matter, so long as correct notions of the elementary part are obtained." Now, if *there were any* separate and distinct "elementary part," it certainly would matter little or nothing whether it were called "cell" or by any other name, provided the name be properly defined and agreed upon. It is not against the name but against the idea of any *isolated individualized form-element*, that the objection lies. Virchow maintains "that the cell is really the ultimate morphological unit in which there is any manifestation of life, and that we must not transfer the seat of real action to any point beyond the cell." Against this statement nearly every author nowadays protests, and insists that vital power must be transferred from the "cell" to "living matter;" yet, after all, the disagreement, though ever so strenuously declared, is a mere verbal one, so long as both parties hold that "every higher animal presents itself as a sum of vital unities," no matter what these unities are called or how defined. Hæckel, one of the most avowed advocates of "the protoplasm or sarcode theory," clings to Virchow's politico-physiological comparison, that every higher organism is like an organized social community or state, in which the individual citizens are represented by the "cells" (no matter how he may define these), each having a certain morphological and physiological autonomy, although on the other hand interdependent and subject to the laws of the whole. Heitzmann's views necessitate the comparison of the body to a machine, such as a watch or a steam-engine, in which, though there are single parts, no part is at all autonomous, but all combine to make up one individual. Even Huxley, the popular champion of protoplasm as the physical basis of life, quite recently delivered an address, before the International Medical Congress in London, August 9, 1881, in which he used the following language: "In fact, the body is a machine of the nature of an army, not of that of a watch, or of a hydraulic apparatus. Of this army, each cell is a soldier," etc., etc. According to Hæckel and Huxley, the body is composed of *colonies* of amœbæ; according to Heitzmann the body *is one complex amœba*. I am very anxious to really make the difference between the cell theory and the bioplasson theory clear to every one of you. The essential point of the cell theory is, the idea that the body and each tissue of the body, every plant, and every animal, is made up of a number of distinct units, and the essential point of the bioplasson theory is, the idea that all the masses of living matter of each tissue

of plants and animals are uninterruptedly connected, and that every tissue is connected with every other tissue by filaments of living matter. To accept Mr. Huxley's comparison, we must imagine that every soldier is indissolubly connected, hand and foot, with every neighboring soldier of the solid army!

There is no *better test* of the TRUTH of the bioplasson doctrine than the structure of hyaline cartilage. If hyaline cartilage consisted, as "is generally believed," of "a homogeneous ground substance, in which are closed cavities harboring the corpuscles," the bioplasson doctrine would certainly be erroneous. If it merely contained lymph, or juice-channels, no matter what their character, whether open or closed, whether lined or unlined, whether in "homogeneous basis-substance," or "between layers of cells," or "in cement-substance," then, too, the bioplasson doctrine would be erroneous.

But the result of my observations admits of but one interpretation, and that an interpretation favorable to the bioplasson doctrine. It is unnecessary to more than mention that although I have placed on record so few, I have made many different examinations, under many different circumstances, and with varying powers of amplification.

To be able to uphold the cell-doctrine, cartilage would have to be, using a homely comparison, like a cake composed of hard dough with raisins. No matter how widely we may extend the definition, to remain within the boundary of the cell-doctrine this metaphor must be applicable. Innumerable painstaking researches have led to various modifications of notions entertained regarding the structure of the two constituents of the cake and their relation to each other. It may be seen by the most recent publications on the subject, that the acceptation of the existence in the dough of cleavage in certain directions, of interlaminary and interfibrillar spaces and of offshoots, even ramifying prolongations of the raisin-substance, or, at all events, of an ingredient of the raisins, is held to be not incompatible with the cell-doctrine. If, however, we can represent cartilage as a filigree or framework of raisin-substance, in the meshes or interspaces of which framework blocks of dough are imbedded, certainly the fundamental view of the ultimate construction of the tissue is changed, and we are no longer in accord with the cell-doctrine, even though we be inclined to use that term in the widest possible sense.

The result of my investigations as to the structure of cartilage is that in this tissue, beyond the possibility of a doubt, the living matter is arranged in the form of a net-work containing in its meshes the

non-contractile matter. How is it with regard to the other proposition of the bioplasson doctrine, viz., that the living matter of the different tissues is interconnected? Examinations with high powers enable me to answer this question to the effect that fine filaments of living matter pass from one tissue to another in connection with the network of living matter in each. The details of these examinations are reserved for another time! But it has been suggested to me that I ought not to conclude without saying a few words as to the *practical* advantages of the Bioplasson-Doctrine over the Cell-Doctrine. Well, *every exact* scientific investigation, even though at first of *theoretical value* only, sooner or later brings with it some practical benefit; and this doctrine of living matter, aside from the satisfaction which the perception of ABSTRACT *truth* grants—lying as it does at the foundation of our knowledge of living things—has advanced their physiology, and pathology at every point! In *Practical Medicine* it has already aided us in so many ways that their merest enumeration would require another hour's lecture. We know that the disposition of living matter is different in different persons, and that in the case of increased supply of food the *reaction* is different in strong and healthy people from that in the sick and weak. Upon this knowledge rests, to-day, the *whole doctrine of pulmonary consumption.* Now, the *amount of living matter* within the same bulk *varies greatly,* both in normal and morbid conditions. A small lump of bioplasson in the urine or expectoration, taken from an individual of *good* constitution, will show a *close* network with coarse granulations, or perhaps be almost *homogeneous*-looking under the microscope—owing to the *large amount* of living matter in the small bulk; while a plastid from a weak, broken down or phthisical person will be finely granular and exhibit a *network with large meshes* on account of the *relatively small amount of living matter* in it. Sometimes we thus from the examination of a *drop of blood* gain an insight into the condition and vital power of the whole individual; sometimes, recognize a disease before it is sufficiently developed to do much harm, and thus come a step nearer to the *highest aim* of the physician—the *prevention* of disease.—Prof. LOUIS ELSBERG, M. D., *Science*, Dec. 10th, 1881.

CIVILIZATION IN ITS RELATION TO THE INCREASING DEGENERACY OF HUMAN TEETH.

The *Independent Practitioner* copies from the *Jour. Brit. Dental Asso.* a paper read by Dr. Norman Kingsley, of New York, before the International Medical Congress, on the above subject. He said:

The most important undetermined problem now confronting the dental profession was embodied in the inquiry made daily by anxious parents in substantially the following form: "Why do my teeth decay more rapidly than my father's or mother's did, and why are my children's teeth decaying at an earlier age than mine?" The inquiry did not come from those who neglected their teeth, or from the lower classes of society, the ignorant or the depraved. It was confined to no particular race or nationality, but came from that class which was the most intelligent, the most highly cultured, and the most finely organized in any community, irrespective of race, locality, or climate. It was useless to treat the inquiry lightly, or to attempt a denial of the premises. The cases were exceedingly rare, if they existed at all, where the teeth of the children were sounder than those of the parents, and we must admit the conclusion that with each succeeding generation the dental organs were becoming more and more degenerate. What response had the practitioner to this inquiry?

After citing the usual varied replies, with comments thereupon, the Dr. continues as follows:

Other vague theories, used often without much understanding, were formulated, but the most comprehensive, and the most tangible withal, which had been made sponsor for this growing curse of the human race, was *civilization*. What was civilization, and what had civilization to do with decaying teeth? It meant, an emerging out of barbarism into refinement, out of ignorance into knowledge, out of bondage into liberty, out of privation into comfort. Civilization expands the intellect, represses vice and savage instincts, cultivates virtue and noble aspirations, encourages the growth of the emotional nature, and enlarges the domain of human sympathy. Civilization defies and controls the elements, organizes commerce, builds cities, railways, telegraphs and factories. Civilization is the divinely appointed method through which mankind derive their greatest blessings, and by which they reach their highest possible state of intellectual, moral, and social development. Only through civilization would the millennial or ideal existence of the human race ever be attained; civilization, therefore, was a normal condition of mankind. In the more refined and luxurious

conditions of life we found physical labor exchanged for mental, and strain of mind took the place of strain of body. Muscular tension ceases, and nervous tension takes its place. The mind is constantly on the alert, and the brain has no rest. The nutrition of muscles and bones is diverted to repair the undue waste of nervous tissue, and, sooner or later come, inevitably, the long list of nervous diseases which now so threateningly confront us. The causes which tend to produce such results were more active and more potent in the Northern United States than in any locality in the globe. The reasons for this had their foundation primarily in the institutions of the country, and the stimulus which the country afforded for the intensest mental activity. But testimony was not wanting that the same thing in kind was now going on in Great Britain, and even heretofore stolid Germany was undergoing a like transition. Nervous diseases and decay of teeth were correlated, both being symptoms of a common cause. The teeth required constant nutrition, as did the muscles, the bones, or any other organs or tissues of the system. Teeth decay primarily because the nutrition of their organic structures being withdrawn, retrogade metamorphosis ensues. Caries is simply solution or disorganization of both constituents by agents which are always external, but which would be quite inert under other constitutional conditions. When nutrition is insufficient or diverted, the resisting power of the vitality inadequate, and destructive agents present, the teeth will yield at their weakest point, and caries is the result. The ordinary remedy for these evils, and the salvation of the race from degeneracy and destruction would seem to involve a return to a condition of life more consistent with hygienic laws. The pessimistic view of the future was without reason, for while degeneracy of the teeth was certainly on the increase in certain families and classes, there were equally certain signs of its abatement. With increasing wealth, families had less cares, less anxiety, less nervous strain, more ease, more attention to hygiene, and better habits of life. The intellectual activity of to-day, and the energy and intensity of modern thought were not inconsistent with a sound constitution, with perfect health in all the tissues, and with long life. It was the worry which wears out the nervous system, and not the work. Civilization, the glory of mankind in their maturity is, nevertheless, in no wise responsible for the accidental effects which have resulted from a violation of her true principles, for out of civilization ought to, and must, come the grandest example of humanity the world has yet seen, without spot, or blemish, or taint of disease.

EXTRACTS FROM THE ADDRESS OF DR. A. M. DUDLEY, BEFORE THE MASS. DENTAL SOCIETY.

The future reputation of this Society will depend greatly upon the character of its past and present members. It therefore becomes us to place as high as possible the standard of excellence, and we should carefully guard against the admission to our ranks of those who occupy a doubtful or low position in our profession. Our success, as an organization, depends more upon the zeal and earnestness with which we work as co-laborers for the advancement of our calling than upon our numerical strength. I think the time has fully come when we should change our Constitution, so that applicants for admission to our Society shall have first graduated from some respectable medical or dental college, or have received a license from some board of examiners appointed under State law, before they shall be considered eligible to membership in this organization. Other dental associations having a large proportion of their members from among dentists resident in our State, and holding their meetings frequently in our cities and towns, have seen the wisdom of placing this limitation upon their requirements for membership, and have witnessed the good results attending its adoption. Why should we, who are regarded as the representative dental organization in our State, longer make it possible for those who are the veriest charlatans in our midst to be entitled, as far as the qualifications we require are concerned, to come among us, and be of us, simply because they have had a sign, denominating them dentists, hung upon some building for the term of five years, and for that length of time have practiced, not in our profession, but upon a too confiding and correspondingly suffering public? It may be true that we have none such now among us, or that it is not often that they seek for admission to this body. But in our present position, we place ourselves upon an equal standing with them. We say to the public that the man who has been in the practice of dentistry for five years, although he may never have gazed upon the pages of a work upon dental science, or may not possess the slightest qualification for such practice in a scientific manner, is just as much entitled to knock at the door of this organization and seek admission to it, as any one, however much he may have studied, or however well qualified he may be, by thorough and special preparation, to enter upon the practice of our calling. Again, our position upon this question is such that we ignore altogether the dental schools and colleges. If a man, without any previous training whatever, can begin, as is not infrequently done,

the practice of dentistry, and after having so practiced for the term of five years, can be entitled to, and gain, admission to this body, simply because of that five years' practice, however bad it may have been, he can say to himself "of what use is it for me to spend my time in attending a dental school? I can be recognized by the representative body of dentists in the State, and the public will then of course recognize me, and I am just as good as any of them." How ridiculous would seem the Massachusetts Medical Society, and how little confidence would the great majority of the public have in it, as a body of intelligent and scientific men, if it allowed any person who had simply called himself a physician for five years, the privilege of claiming, for that reason, the right to membership in that body. The question will not bear consideration for a single moment, and yet our position is just as ridiculously absurd as theirs would be if it were such as I have stated. I do not wish to be understood as denying the fact that we have in our profession many men who have never graduated from any medical or dental school, and yet who, by reason of long experience and private study, are well qualified for pursuing their chosen avocation. But I believe the time has fully come when the only legitimate and recognized entrance to our ranks should be through the educational institutions of our specialty, or those of general medicine. These schools are so numerous, and the facilities for acquiring a proper dental education are so many, that there is no longer any excuse for a person's entering upon the practice of the dental art without first having graduated from some respectable and recognized dental or medical school. I will not argue this question further, although much remains to be said in favor of the adoption of the measure I have urged. I leave the subject in the hope that our Constitution may be speedily changed so that we may occupy a higher and more consistent position.

I do not hesitate to declare, after most mature reflection upon the matter, in all its bearings and influences, that it is urgently important that our profession in this State should be also protected, as are the legal and educational professions, by legislative guards and restrictions. Everybody knows that no applicant to the first named of these two is admitted till after he has successfully responded to the severest ordeals of examination by qualified experts. The law accords this justice in order that the members may protect their professions from obtrusive pretenders who have never achieved the intricate knowledge that their theory and practice demand; and the professions accord to the public the protection and defence which such restrictions provide,

that the public may not be duped by charlatans, nor misled and harmed by ignorance. By our educational laws, protection is afforded by the restriction that no person shall be employed as a teacher in any school in the State, until such person shall have been actually examined, and, if found qualified, duly approved by the committee of the city or town wherein such person has applied for appointment. And the law further declares that the Treasurer of such city or town shall refuse payment of the bill of a teacher for service rendered, until he presents a certificate setting forth that examination has been held and approval given. And should any unapproved teacher chastise a pupil for alleged ill-conduct, an action for assault may be maintained. Now with such protection for the law and the school, and with such protection as the clerical profession has provided for itself, all these protections having, as their ultimate object, the protection of the public, it would seem that argument was hardly necessary to show its necessity in the profession of the dentist. May we not hope that it will be secured by effort from within our own organization. I know it will be urged that it will be useless to appeal to the legislature, in view of the recent non-success of the physicians and pharmacists in their endeavors to secure such enactments as they have desired. But an examination of the subject will show that the causes which led to their defeat will not apply to us; and I believe that earnest effort upon the part of this society, through the labors of a committee appointed for the purpose, with such coöperation as may be secured from other societies in the State, will give us a law that will prove of great value to the dental profession and to the public. I most earnestly urge the adoption of such a policy as wise and necessary.

Dr. Luton, of Rheims, reports that he has discovered that the tincture of ergot of rye, associated with phosphate of soda, produces on those to whom it is administered an hilarious excitement similar to that which is brought on by laughing-gas.—*Popular Science Monthly.*

In re-pointing instruments care must be taken not to overheat them; it injures the steel. They will be found much improved, if, before bringing them into the desired shapes, they are pounded considerably. This reduces any assumed crystallization heat may have produced, to the more fibrous condition of the best steel.—*Items of Interest.*

EDITORIAL.

It is not simply boldness or the wish of notoriety which induced us to accept the duties of a "Scientific Editor" of the *Journal*, but the impulse of strong—very strong—convictions and opinions, supported by extensive studies of chemistry and medicine in German universities. Chemistry is growing more and more powerful; medicine, which formerly considered chemistry only as one of its servants, is falling slave to the new queen of sciences; physiology has long time ceased to consider its topics as being different from those of a highly developed chemistry; chemistry is appearing on the field of all branches of science, and also dentistry will sooner or later fall its victim. Perhaps the fact that we never finished entirely our course of medicine, but turned into chemistry as a speciality, gave us more taste for physiology, etiology and diagnosis than for therapeutics, while it supplied us with a large amount of useful and thorough instruction in the medical branches by the most famous teachers of Germany. Chemistry is the most positive of all sciences, and the character has a tendency to go from the science to the student. We therefore love facts and positive knowledge. But as the best facts, without reason, never will be of much use, we shall exert our best reason to build on sound facts sound conclusions. As far as our influence will go with the *Journal*, we vouch unflinching fight to all vagaries of language and theorizing. We fully accept the grand discoveries of Dr. Carl Heitzmann of New York and his followers, as the basis of our physiological views.

We, of course, are not responsible for the communications of our fellow-editors, and do not intend to interfere with their views. We believe in the independence of all contributors.

Probably the reader himself will notice the new features of the *Journal*. All the good in common journalism will be used by us. We invite all who wish progress and enlightening to send us contributions, and all those who do not agree with us, may they give *the best expression* to their objections. Truth never suffers, and, regardless of creed, school or title, we beg them to bear in mind, if our attacks and criticisms seem harsh or personal, that we want nothing but "*the truth, the whole truth, and nothing but the truth.*"

CH. MAYR, A. M., B. S.

RAMBLINGS AMONG THE MONTHLIES.

The *Cosmos* of December opens with an article on "Liberty, without Law, is License," by Dr. W. P. Church. The title is rather strange and, put in such a general way, certainly wrong; every term of the saying not admitting of an exact definition, there follows that the whole saying is full of snares for the unsophisticated mind. From the vigor with which Dr. Church defends "government at any price," there is reason to suppose, that he is within the party governing in Rhode Island, not within the one governed. Government looks all right seen from within, but not quite so, from without. Many sentences are stated with a surprising dogmaticism, sounding rather more Russian than American. "Man, from his nature, must serve." "There must be a dominant power," etc. The whole paper shows clever sophisms, sentence for sentence. We, of course, approve a certain amount of government's control over all affairs of life, but only as far as the individual cannot protect himself without this aid; but this law-making craze to swell the statute-book with dead and cumbrous sections, which only now and then serve in the hand of the stronger to annoy the weaker, ought to be resisted by all means. As dentistry is an art and science, by which *irreparable* injury can be inflicted, it ought to be regulated to some extent; but will all law-making ever prevent that even the best practitioner now and then blunders, not to speak of the "minor gods"?

The proceedings of the American Dental Association are reported very elaborately. In discussing "caries," there appears to be a general neglect of the fact that lime-salts do not necessarily want an acid for their solution. By no means! There are many neutral and even alkaline fluids that will dissolve lime-salts. It is well known that sugar will dissolve carbonate and hydrated phosphate of lime, the first to a very considerable extent; if chemists analyze for the so-called alkaline earths, they can prevent entirely precipitating the carbonate of lime by adding ammonium-chloride. This mixture of ammonium-carbonate and ammonium-chloride is strongly alkaline, yet it will keep in solution large quantities of carbonate of lime. Many other substances act in the same way. Therefore, gentlemen, in theorizing, do not forget that the lime-salts of the tooth do not necessarily need acids for their solution!

The arsenic question came up in the meeting of the Odontological Society of Pennsylvania. We reserve it to ourselves to enter thoroughly upon this question in one of our next numbers.

The closing number of the "*Miscellany*" contains one of Dr. W. H. Atkinson's valuable papers. His strong attacks on the old rut may seem at first reckless, yet the more one enters into a careful study of Dr. Heitzmann's beautiful discoveries, the more one feels nebulosity in the old view, truth and clearness in the new one. The term "proto-vertebræ" seems to be a misnomer, being in the first place a mongrel between Greek and Latin, and then it might mislead, since "vertebræ" at present has an exact and universally adopted meaning, while these "proto-vertebræ" have nothing whatever to do with the real vertebræ. In fact, when we first heard the term, it suggested the idea, that they were small disks making up the embryonal vertebral column, which is impossible, as the ontogeny of this organ shows that it originates as a furrow in all its length by one process of doubling up. This term is so misleading, that we would rather suggest the term "proto-disks," or any other name which might not produce a wrong first impression.

Dr. I. B. Davenport publishes his paper on Chemical Abrasion. His conclusions seem to be in the main in accordance with and based upon chemical and physical facts.

In an editorial the *Miscellany*, in parting, gives heaps of good hints as to the "Coming Dentist; What We Want; Enlightening the People, and Duties of a Dentist."

The first article in the *Ohio State Journal* is a very interesting lecture on the muscles of the lower jaw. In any case of accident with breaking of the jaw and consequent dislocation, the article merits to be consulted, since it treats as plainly and elaborately the special effects of muscular traction, as it might be expected and wanted.

In an article, "Development of the Enamel," Dr. M. S. Dean utterly ignores the discoveries of Dr. Heitzmann and Bœdeker about the structure of the enamel. He considers it as "general belief" that the "gelatinous mass which forms the greater portion of the enamel-organ, filling up the interstices between the stellate cells, has no more important function to perform than to fill up the space which is to be subsequently occupied by the growing tooth." Apart from the unscientific "general belief," we should like to know on what grounds this exceedingly inadequate supposition is given as "general belief." The theory of "this proteïne substance being a storehouse of phosphate of lime," seems utterly untenable on closer investigation; we will not be able to account for the lime-salts in the enamel unless we accept the fact of vessels and circulation in the enamel; the lime-salts of the

enamel are the secretions of the bioplasson of the enamel, just as the coral rock is the secretion of the coral animalcules.

Dr. F. W. Sage continues an article on "Alveolar Abscess," full of excellent points in practical directions.

In a report on Pathology to the Kentucky State Dental Association on "Pulpless Teeth," by Prof. A. O. Rawls, the author makes the strange statement: "The general impression is that, since the dentine and cementum are not analogous in their structure, and that one being furnished with nutriment from without and the other from within, that accordingly there is no continuity of nutrient circulation from one to the other, but that they are separate and distinct tissues." This "general impression" needs general correction. Every one of these statements has been proved to be, to say the least, highly hypothetical. Has Prof. Rawls never looked at Dr. Bœdeker's drawing of a tooth in the Cosmos? We would only request him to do it and to read the accompanying paper, and then he may himself criticise his own statement. That the "cementum is nourished from without" is strange, and needs careful confirmation; but perhaps a look at the cuts will reverse the course of the nutrition. Many of the conclusions based upon this "general impression" become faulty, as the basis is wrong. We should like to enter into the paper more, sentence for sentence, and to show how easily one may draw quite plausible conclusions from wrong premises. The best saying of the article is: "A practice based upon an erroneous conception of its underlying principles cannot be progressive, and can be conservative only by accident." (Sic!)

We can hardly understand why an anonymous in the *Ohio Dental Journal* makes cheap fun of a good and necessary undertaking—the dental nomenclature and terminology—as attempted by one of the standing committees of the American Dental Association. The only words to criticise such an article, are, that it is infantile and microcephalic. People who think such negro-minstrel-effects of criticism adapted to a scientific paper, should rather have been born before the invention of the printing press. Far better, quite appropriate, and just as full of useful hints as a serious article, is the little comical story by F. M., in the same paper. It is very well told, and we could not help laughing heartily over it.

Among the subjects of interest to dentists in the *Independent Practitioner*, is a reprint of an article on the nature and mode of origin of the lead line in the gums, by Hilton Fagge, which shows a careful and critical observer.

Another article of general interest is an abstract of an address of Dr. John Simon's, before the section on public medicine at the International Medical Congress, on "The Value of Experiment in Preventive Medicine." He will have the endorsing of every lover of truth in his attack upon the law against vivisection, as passed recently in England. Only ignorance, joined with mediæval superstition and modern æsthetic vagarism, could bring about the passage of such a law, which, as Dr. Simon plainly shows in some cases, forces English physicians to make their experiments outside of England!

Dr. W. C. Barrett opens the ***Dental Jatrus*** with an article which will swell the heart of every dentist, if he reads how dentistry has progressed during the last twenty years, and, from a mere mechanical craft, like a blacksmith's work, has become a science.

As we bow ourselves, with our editorial hat in hand, into the sanctum sanctorum of the Independent Practitioner, may we be allowed to offer our most cordial and appreciative congratulations in view of what may be confidentially expected of it in the future, judging by its past, but, more especially the "NEW VOLUME," to wit, the January No. From your ***electric light*** we shall expect to draw much assistance in maintaining our ***sperm candle*** up here in New England.

Our abstract from Prof. Elsberg's lecture on "The Cell-Doctrine and the Bioplasson-Doctrine" is a long one; but if every dentist who does not already understand the theory, or ***fact***, we should say, will read and re-read it until he has thoroughly ***assimilated*** its truth, it will be ***invaluable*** to him in his practice, to say nothing of the personal satisfaction of a true conception of primal facts.

We are glad to note the fact that Mr. Wm. M. Williams, of our local dental depot, has added to his large stock of dental supplies a department of medical and surgical instruments. We suppose this to be one of the results of the recognition of dentistry on the part of the American Medical Association. How is it, "Billy?"

Exchanges of medical, dental and scientific journals are respectfully solicited.

The "Annual Address" delivered before the Mass. Dental Society, last June, by Albion M. Dudley, D. D. S., is worthy of careful reading and consideration by every member of the Society. It has no weak point, or uncertain sound. Could every member of the Massachusetts Legislature listen to, at least, that portion of it which speaks of the desirability of regulating the practice of dentistry by "*legislative guards and restrictions*," they might possibly see that the interests of every citizen *imperatively demand* such legislation, and govern themselves accordingly. This part of the address wisely precedes that on professional education. Nothing could be a greater inducement to one entering the profession to devote time and money to a thorough preparatory course of instruction than to feel that the laws of the State recognize dentistry among the educated professions, and protects its members from professional association with the unqualified and undeserving. The address as a whole should be read by every young dentist especially. It would tend to raise him to a higher standard, and insure for him a larger field of usefulness and, correspondingly, greater pleasure in his life-work. We regret that we must content ourselves with only an *extract* in this number.

We think we are but voicing a universal sentiment when we say we are sorry that the "*Miscellany*" has ceased to exist. This is especially true here in New England where the democratic qualities of this journal were appreciated by a very large class. It was to a greater extent an organ for many of our New England Societies and members of the profession, generally, than any other, and one that the average class of dentists, at least, could feel was approachable. On this account it was none the less ably conducted, or less valuable. Its editors and proprietors will carry with them a large measure of kindly good feeling, and cordial wishes for success and happiness in their new field, on the part of the profession, because of past courtesies, reciprocal favors and agreeable relations. In closing the series of these volumes we honestly confess to a feeling that much is lost to the pleasure and satisfaction of our professional life.

Brother Watt, we are heartily glad to welcome your *Monthly*. Such good things cannot come too often. We, as individuals, have had and enjoyed you from your "Genesis," but our publishers would like to Ex.

PROSPECTUS.

First.—We believe that there is a promising field of usefulness in New England for a wide-awake, wisely-conducted Dental Journal, heretofore occupied only in part, and prospectively, by recent events in dental literature, almost entirely "shut out in the cold."

Second.—We believe, also, that the facilities, and a sufficient amount of concentrated energy and determination are at our disposal to warrant us in undertaking the responsibility of meeting this demand.

Third.—We recognize the fact that, to a greater extent than ever before, the dental profession "is imbued with the spirit of *original investigation;*" that never before has there been so earnest a demand for *absolute facts and scientific exactness*, in place of careless statement, fanciful theorizing and undue reverence for venerable authorities. In view of which, we have secured the services of an eminent and broadly educated scientist, not only to preside over this department of the Journal, but to work with us in a systematic review and sifting of the accepted basal principles of dental science and a diligent and organized search for such new truths as the rapidly advancing and broadening fields of the sciences in general may have in store for our specialty. Results from this source will be promptly communicated through this Journal.

Fourth.—The "Associated Dentists," who comprise the general editorship, are all actively engaged in the practice of dentistry, and are entirely independent of all alliances and ambitions other than the best interests of the profession in its highest sense.

Fifth.—It is hoped that the dental profession will make free use of these columns as a ready means of intercommunication. Consider it, gentlemen, as your own, and take an active interest in it. We especially call the attention of Secretaries of Societies to this point, and hope they will act upon it.

Sixth.—While we are domiciled in New England, and assume our name as a convenient one to distinguish this from other Journals, we nevertheless aspire to the plain of making our influence felt for good, in common with so many other New England institutions, throughout the entire land.

Seventh.—We must confess to a hurried preparation of this number, which necessarily involves many shortcomings, calling for the kindly exercise of charity; but, with more time, and the completion

of present imperfect arrangements, we expect to enlarge our space, and sharply compete for supremacy in dental journalism.

Eighth.—We earnestly solicit the aid of the profession in subscriptions, and original contributions, incidents of practice, etc., promising, on our part, to exert ourselves to the best of our joint ability to realize your ideal of a dental journal.

Ninth.—Terms of subscription are $2.00 per year, in advance. Single copies, 25 cents.

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SOCIETIES.

PROCEEDINGS OF THE CONNECTICUT VALLEY DENTAL SOCIETY.

The Annual Meeting for 1881 was held at Springfield, Oct. 27 and 28, at which a number of new members were enrolled.

Prof. SHEPARD presented models of a case of replantation, and the tooth that had been replanted.

Prof. MAYR presented a paper, entitled "A Synopsis of the Rare Elements and their Possible Use for Dental Purposes." This paper caused much interesting discussion.

The evening session of the first day was devoted to the adoption of a new Constitution and By-Laws, and election of officers.

It is hoped that this new Constitution will materially benefit the Society, by dividing the work more generally among the membership.

The following officers were then elected:

President—Dr. C. FONES, Bridgeport, Conn.
1st Vice-President—Dr. N. MORGAN, Springfield, Mass.
2d Vice-President—Dr. O. F. HARRIS, Worcester, Mass.
Secretary—Dr. A. M. ROSS, Chicopee, Mass.
Assistant Secretary—Dr. S. E. DAVENPORT, New York.
Treasurer—Dr. W. H. JONES, Northampton, Mass.

Dr. F. Searle, who at a previous meeting had handed in his resignation as a member of the Society, for purely personal reasons, withdrew the same, much to the gratification of those present.

A pleasing feature of the morning session, the second day, was the exhibitions made by different members to the Society, under the head of Special Methods.

Dr. Strang exhibited an appliance for regulating teeth, to be used either outside or inside the arch at pleasure. Also, an appliance for elongating teeth.

Dr. C. F. Bliven and Dr. C. T. Stockwell exhibited useful appliances for the operating table.

Dr. Shepard exhibited English forceps, teeth, and appliances of different kinds.

Dr. E. S. Niles gave a resume of his experiments and investigations of phosphate fillings. He said there were four or five kinds of phosphoric acid, and therefore many different kinds of phosphate fillings. The liquid part of these fillings is a dibasic acid, $2\ H_2O\ P_2O_5$, and has its objections, as the soda which is added is soluble in pure water. Care should be taken to keep these phosphate filling materials from the air, as they absorb moisture. The doctor advanced the idea of putting up the acid and powder in separate tubes of glass, a sufficient quantity in each—the two, when combined, to make a large filling. These tubes are closed at each end by placing the ends in a flame of the Bunsen burner. The heat making the glass molten, and also expanding the air in the tube, makes the receptacle, when sealed, a vacuum. The powder which should be used is the mixture of oxides of silica and zinc. Fillings prepared from such a mixture wear very much better than those in which the oxide of zinc alone is used. The fact that the liquid congeals in some cases, as in Fletcher's cement, for instance, may be due to the presence of nitrate of silver or to aluminum, though my tests in that direction are not complete.

Dr. C. W. Strang presented a paper entitled "Contour Filling *vs.* Free Separation Method for Preserving the Teeth." This paper was listened to attentively, and also discussed.

This very interesting topic for discussion was next in order before the Society: "Do Serious Results follow the Extraction of Teeth for Girls between the ages of Eleven and Fifteen Years?"

Prof. L. D. Shepard, in reply to the request to give a report of the International Medical Congress, gave, without any preparation for it,

a very pleasing and entertaining description of the Congress, from memory, and described the manner of giving invitations to members to dinners, receptions, etc.

The President appointed the following Executive Committee :

Dr. C. T. STOCKWELL, Springfield, Mass.

Dr. J. J. VINCENT, Amherst, Mass.

Dr. C. W. STRANG, Bridgeport, Conn.

It was voted that unless the Executive Committee decide upon a union meeting with the Merrimac Valley Dental Society, the semi-annual meeting for 1882 should be held at Amherst, Mass.

Adjourned.

MASSACHUSETTS DENTAL SOCIETY.

The seventeenth Annual Meeting of the Massachusetts Dental Society was held in Boston, December 8 and 9, 1881—the President, Dr. G. F. WATERS, in the Chair.

The committee to petition the Legislature for a law regulating the practice of dentistry in the State reported progress, and was continued.

The following officers were elected for 1882 :

President—D. B. INGALLS, Clinton.

1st Vice-President—A. B. JEWELL, Newton.

2d Vice-President—D. M. CLAPP, Boston.

Secretary—W. E. PAGE, Boston.

Treasurer—EDWARD PAGE, Charlestown.

Librarian—R. R. ANDREWS, Cambridge.

Executive Committee — Drs. E. B. HITCHCOCK, D. F. WHITTEN, LEON RIDEOUT, F. M. ROBINSON, F. E. BANFIELD.

W. E. PAGE, D. M. D., *Secretary.*

PHYSIOLOGY AND HISTOLOGY.

Dr. William H. Atkinson, of New York, said at the Semi-Annual Meeting of the Conn. Valley Dental Society, June, 1881, much upon the fundamental truths underlying Physiology and Histology. Among the many good things, he said :

"All up to 1874 concerning researches in histology was vague and unsatisfactory. The *primal* truths were not discovered until Carl Heitzmann demonstrated the organism of protoplasm. We have none of this in our text-books, and therefore they are no guides but

in a false direction. Too many think that studying histology means simply the memorizing the statements in books. I do not object to histologists recording their interpretations of what they see, but I do object to their requiring the reader to receive, without fair specimens of what they see, their records. The only *study* of this subject is by actual observation with the microscope.

Remak discovered the mesoblast which produces the nerves; until then only epiblast and hypoblast were known. In an early stage of development, the embryonal corpuscles divide into bone plates, nerve plates and muscle plates. These proto-vertebræ are not distinguishable by their shape yet, but their location shows us the difference.

Take the chick between the fourth and tenth day of incubation, and slice it along the line of the primitive spinal column, and you will see accumulations, that is, oases of round bodies in the lay out, not very clearly definite. These are the proliferations of embryonal corpuscles.

I want every seeker after the truth of histology to know that principles must be first apprehended; that the organization of protoplasm must come first within our conception. This is the corner stone first to be laid."

AMERICAN ACADEMY OF DENTAL SCIENCE.

President, ...	Dr. T. H. CHANDLER, . . .	Boston.
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Librarian, ...	Dr. H. C. MERRIAM, ...	Salem.

Censors, Drs. C. P. WILSON, J. H. BATCHELDER and J. T. CODMAN.

In a previous report of the last meeting, which occurred October 26, 1881, unfortunately the gentlemen's names who officiated as essayists were omitted. They were as follows:

Dr. BENJAMIN LORD, New York.
Dr. S. F. STEARNS, Boston.
Dr. GEO. L. PARMELEE, Hartford.
Dr. H. C. MERRIAM, Salem.

Dr. MERRIAM made remarks upon sand-paper disks in place of a written essay.